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COMPLETE SPECIFICATION

An Improved Edge-Dressing, Edge-Profiling and Groove-Milling Apparatus, for Woodworking, Driven by an Electric Motor

I, ROMAN SCHUSTER, of Bahnhofstrasse 9, Neu-Ulm, Germany, a German Citizen, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to an edge-dressing, edge-profiling and groove-milling apparatus driven by an electric motor, for woodworking, consisting of a base plate provided with handle and having slip surfer on its underside and of a vertically disposed electric motor mounted on said plate and having a downwardly projecting milling cutter spindle.

Heretofore, the finishing of glued-on peripheral parts and the dressing of edges of furniture and the like have either been effected by means of hand tools such as planes and the like, or else the work-piece had to be placed on a suitable machine, for instance a milling machine. The finishing of door rabbets and the like, also, for the most part had to be effected by hand by means of rabbet planes and the like. The present invention considerably facilitates the abovementioned operations, i.e., the dressing and profiling of glued-on peripheral parts or other wooden parts, the dressing of veneered edges, the trimming of veneers, the manufacture of all kinds of frames, and the final dressing of rabbets, for instance on doors, door frames and windows.

According to the invention the motor is mounted in a lateral extension of the base plate, said extension being elevated relatively to the slip surfaces, and to the end of the extension remote from the base plate there is attached an angular feeling device enabling a feeler to be adjusted horizontally and vertically.

This new apparatus and the varied uses thereof are more particularly described hereunder with reference to embodiments chosen by way of example and illustrated in the [Price 2/8]

accompanying drawings, in which

Fig. 1 is a lateral elevation of an apparatus for dressing and profiling edges driven by an electric motor;

Fig. 2 is a plan view thereof (without the electric motor);

Fig. 3 is a view in elevation from below, seen in the direction "A" in Fig. 1;

Fig. 4 is a view in elevation of a detail, seen in the direction "B" in Fig. 1 (on a larger scale);

Fig. 5 is a longitudinal section on line V—V of Fig. 4;

Figs. 6 and 7 show different operations being performed by the apparatus illustrated in Figs. 1 to 3;

Fig. 8 shows details of Fig. 7 on a larger scale;

Fig. 9 shows the apparatus, illustrated in Figs. 1 to 3, performing a different milling operation; and

Fig. 10 is a plan view thereof.

In the drawings, 1 is a base plate having at the top a handle 2 and at the bottom slip surfaces 3 to 5 on which the apparatus illustrated rests when it is placed on the work-piece which is to be treated. The base plate 1 is provided with a lateral extension 6 in which is mounted a unit consisting of an electric motor and a milling cutter spindle 75 and disposed perpendicularly to the base plate. This unit consists of a high-speed electric motor 7 and a milling cutter spindle 8. This spindle is preferably mounted removably in a threaded neck 9 of the motor. In the advantageous embodiment illustrated, the lateral extension 6 is formed as a slotted clamp ring having an internal thread, in which the threaded neck 9 having an external thread is adjustable in an axial direction and capable of being fixed rigidly by means of a screw bolt 10. By this axial adjustment, which alternatively may be effected in other ways, the tool (not shown in Figs. 1 to 3) fastened to the milling cutter spindle 8 can

be accurately adjusted vertically relatively to the slip surfaces 3 to 5 and therefore to the work-piece. In order to obtain exact horizontal adjustment of the milling tool 5 relatively to the work-piece during the treatment of edges and like work, a feeler 11 is provided. For attaching this feeler 11 to the lateral extension, in the embodiment illustrated an angular holder 12 is used 10 which has a long arm 12a and a short arm 12b (see also Figs. 4 and 5). The arm 12a is provided with a longitudinal slot 13 which is used for longitudinal sliding or adjustment in the direction A. For attaching this holder to the lateral extension 6 15 there is provided a screw bolt 14 fixed in the extension and a nut 15. A handle 16 is screwed on to the free end of this screw bolt 14, and this handle 16 together with the 20 handle 2 enable the apparatus to be handled conveniently and safely.

According to the drawing the feeler 11 is formed as a slide and is mounted in the corresponding guide in the holder arm 12b, 25 i.e., the feeler is capable of being slid and adjusted in the direction B. A screw bolt 17 is used for clamping the feeler 11 on the holder 12. As may be seen from Figs. 4 and 5, there is also provided a filler head 30 screw 18 for minute adjustment of the feeler 11, the head 19 of this screw engaging in a corresponding groove 20 in the feeler.

Figs. 6 and 7 illustrate by way of example 35 the use of the new apparatus in the treatment or dressing and profiling of the edges of wooden slabs 21 and 22 or the like. In these operations the apparatus is placed on the work-pieces 21 and 22 so as to rest on the 40 base plate, i.e., on the slip surfaces 3 to 5 thereof. In the example illustrated in Fig. 7 a wooden slab 22 is provided with glued-on peripheral parts 23 which are dressed and profiled (rounded off) at the top and trimmed 45 at the bottom. For this purpose a suitable cutter 24, and also a saw 25, are fastened to the milling cutter spindle 8. Alternatively, a milling cutter similar to 24 may be attached instead of the saw blade 25, if the bottom 50 edge also of the part 23 is to be dressed and rounded off. As is shown, the feeler 11 is situated between the tools 24 and 25. The external (in this case semicylindrical) bearing surface 11a (Fig. 3) of this feeler corresponds exactly to the fly circle diameter of the 55 cutter, and the feeler is exactly concentric with the cutter, i.e., as shown in Fig. 8 the fly circle radius r_F of the milling cutter 24 is exactly equal to the radius r_T of the 60 feeler. Because of the form of the feeler 11 and the fact that this feeler can be accurately adjusted, it is possible to effect even the most delicate operations, for instance the dressing of thin high-class veneers, by means of the 65 milling tool without damaging these veneers.

If the milling tool after wearing out is re-ground and the fly circle diameter thereof somewhat reduced thereby, the feeler 11 can be accurately adjusted to this new fly circle, diameter, by being moved in the direction B. 70 In this respect the apparatus according to the invention is superior to known milling devices having approach rings placed on the milling cutter spindle, since the diameter of these rings cannot be altered and therefore 75 when the cutter has been re-ground the rings can no longer be used.

In Fig. 3, the edge of a wooden slab 22 or the like, which is to be treated, is indicated by dot-dash lines. Thus, the apparatus can 80 be swung in the plane of the drawing, in the direction of the arrow C, about the point a against which the feeler bears. But since as explained above the semi-circular bearing surface 11a of the feeler 11 is always concentric with the fly circle of the cutter, 85 such swinging of the apparatus (even over a large angular range, for instance from 60° to 90°) has no effect on the milling operation, i.e., even if such swinging takes 90 place the outer edge of a veneer or glued-on part cannot be damaged. Accordingly, the new apparatus also renders possible the dressing and profiling of work-pieces having sharp corners, so that for instance according 95 to Fig. 3 the apparatus provided with the feeler 11 can even be taken round the sharp corner b without damage to this corner.

In the example according to Fig. 8 glued-on peripheral parts 23 have to be dressed 100 and profiled which originally have portions 23a, indicated in broken lines, projecting beyond the plate 22. But these projecting edges in no way impair the operation of the new apparatus, since the base plate 1 having 105 the slip surfaces 3 to 5 is arranged unilaterally and at a distance from the milling cutter spindle. According to Fig. 3, preferably three slip surfaces 3, 4 and 5 are provided so that as a result there is secure 110 three-point support on the work-piece. To make it possible also to machine slabs having peripheral glued-on parts on all sides, according to Fig. 3 the slip surface nearest to the milling cutter is so arranged as to be 115 set back by the amount s , relatively to the milling cutter spindle, in the direction opposite to the direction of advance D.

Furthermore attachment means, for instance threaded holes 26 and screw-bolts 120 co-operating therewith, may be provided to enable a larger slide plate 27, for instance as indicated in Fig. 10, to be attached to these slip surfaces. These threaded holes 26 may be used for attaching a still larger 125 plate so that said plate can be used as a work table if the new apparatus is for instance clamped to a joiner's bench by means of the handle 2 and used in a stationary and inverted position as a milling cutter 130

for slats and the like.

In the example of operation illustrated in Fig. 6, a cylindrical milling cutter 28 is provided which is being used for machining the edges 21a along their whole length. In this case the work-piece 21 is clamped on to a slab 29 which serves as a former against which the feeler 11 bears. Instead of a cylindrical milling cutter, a form cutter may alternatively be used if required, if the edge is to be formed with a definite profile. In the embodiment according to Fig. 9, a rabbet 30 in a door, window-frame or the like is being finished by means of a cylindrical cutter 31. In this case, instead of the feeler described above a guide rule 32 is attached to the holder 12, which rule together with the larger slide plate 27 renders possible accurate finishing of the rabbet 30. If it is required not merely to plane down such a rabbet but actually to cut one out of the solid wood, the guide rule is set lower, as indicated in broken lines at 32a, and in that case slides along the surface e of the work-piece.

By means of the new apparatus it is also possible to cut grooves in the top side of a work-piece, for instance a dovetail groove as indicated at 37 in Fig. 9.

Thus according to the above description the new apparatus is capable of being used in a great variety of ways and enables dressing, profiling, cutting of grooves and the like to be effected rapidly, conveniently and accurately *in situ*.

The new apparatus is also distinguished by being of simple construction and light in weight, and is therefore extremely easy to handle. A further advantage of this device is that by reason of the unilateral arrangement of the base plate 1 the milling tool is unobstructed over a large region and therefore the new apparatus can be used for finishing work even on doors and windows that have already been installed, without hindrance by the base plate. A further great advantage of the new device consists in the fact that the tool, and therefore also the working point, is clearly visible, this too being due to the unilateral arrangement of the base plate and also to the narrowness of the lateral extension 6.

What I claim is :—

1. An edge-dressing, edge-profiling and groove-milling apparatus, for woodworking, consisting of a base plate provided with handles and having slip surfaces on its under side and of a vertically disposed electric motor mounted on said plate and having a downwardly projecting milling cutter spindle, characterised in that the motor is mounted in a lateral extension of the base plate, said extension being elevated relatively to the slip surfaces, and that to the end of the extension remote from the base plate there

is attached an angular feeling device enabling a feeler to be adjusted horizontally and vertically.

2. An apparatus as claimed in Claim 1, characterised in that to the lateral extension there is attached an angular holder which by means of its long arm is adjustable in the direction of the milling cutter spindle, whereas the feeler formed as a slide is mounted on the short arm of the said holder in such a manner as to be capable of sliding radially on this arm and of being locked thereon.

3. An apparatus as claimed in Claim 1 or 2, characterised in that the feeler, which preferably is provided with a hole for the passage of the milling cutter spindle, has a semicircular bearing surface corresponding to the fly circle diameter of the milling cutter.

4. An apparatus as claimed in Claim 2, characterised in that for minute radial adjustment of the feeler a fillister head screw is provided in the holder, the head of this screw engaging in a suitable groove in the feeler.

5. An apparatus as claimed in Claim 2, characterised in that for attaching the holder, which is provided with a longitudinal slot, a screw bolt is provided in the lateral extension together with a clamping nut and that a handle is screwed on to the free end of this screw bolt.

6. An apparatus as claimed in Claim 1, characterised in that on the motor there is provided a threaded neck, having an external thread, in which the milling cutter spindle is mounted and that the lateral extension is formed as a slotted clamp ring having an internal thread, which ring is used for adjustable mounting of the threaded neck.

7. An apparatus as claimed in Claim 1, characterised in that on the base plate three flat slip surfaces are provided in such a manner as to afford three-point support.

8. An apparatus as claimed in Claim 7, characterised in that the slip surface nearest to the milling cutter is so disposed as to be set back relatively to the milling cutter spindle in the direction opposite to the direction of advance.

9. An apparatus as claimed in Claim 7, characterised in that on the slip surfaces fastening means (for instance threaded holes and screw bolts) are provided for attaching a larger slide plate.

10. An apparatus as claimed in Claim 2, characterised in that guide rules having if necessary a recess for the milling cutter are provided, which can be mounted on the holder in such a manner as to be capable of sliding and of being locked thereon, in place of the feeler.

11. The improved edge-dressing, edge-

profiling and groove-milling apparatus, for ing drawings.
woodworking, substantially as hereinbefore
described and illustrated in the accompany-

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Fig.1

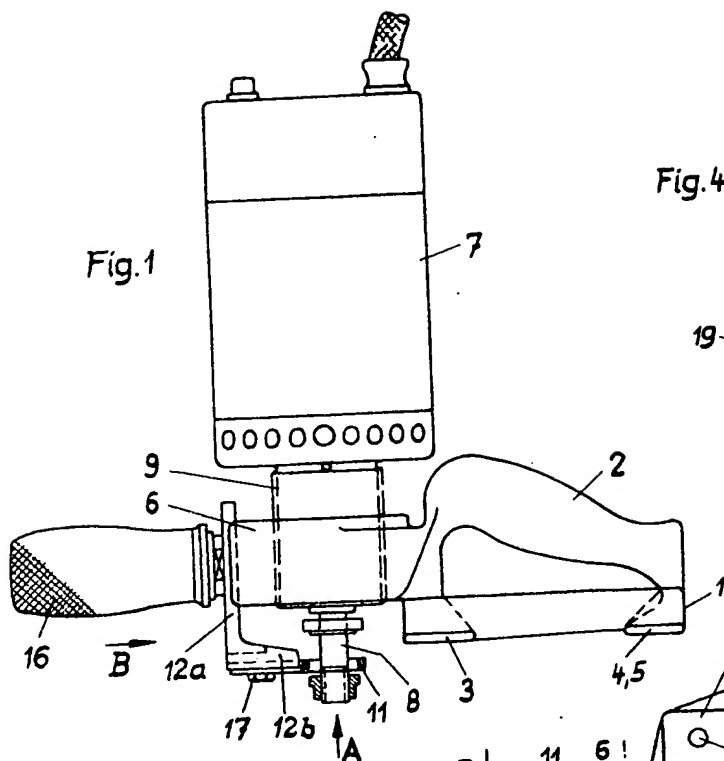


Fig.4

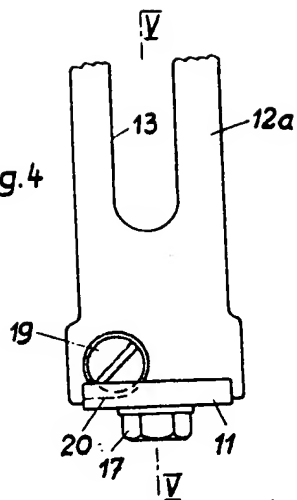


Fig.3

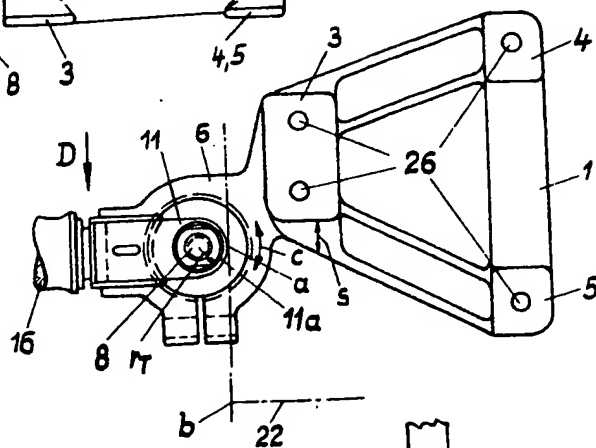


Fig.2

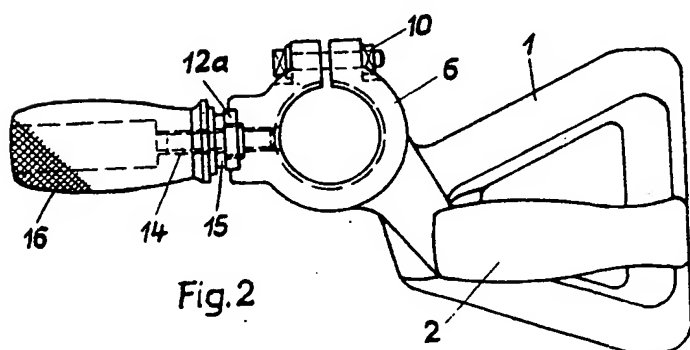
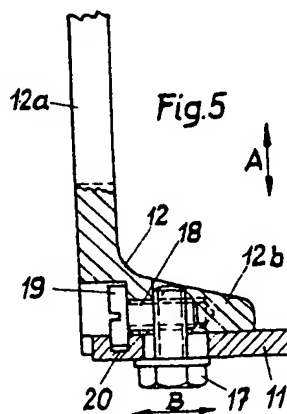


Fig.5



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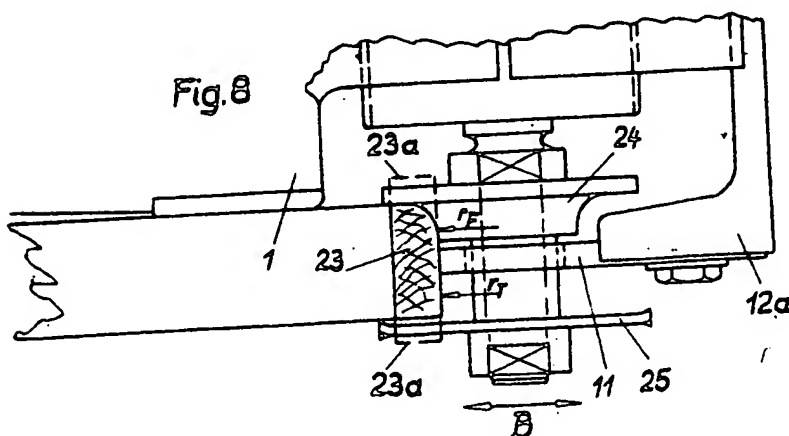
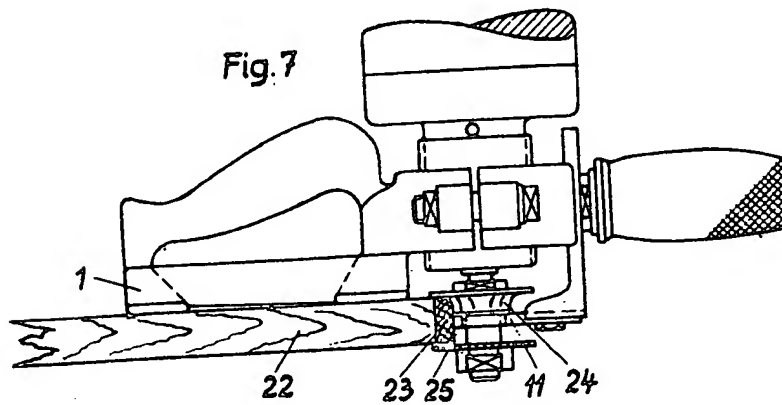
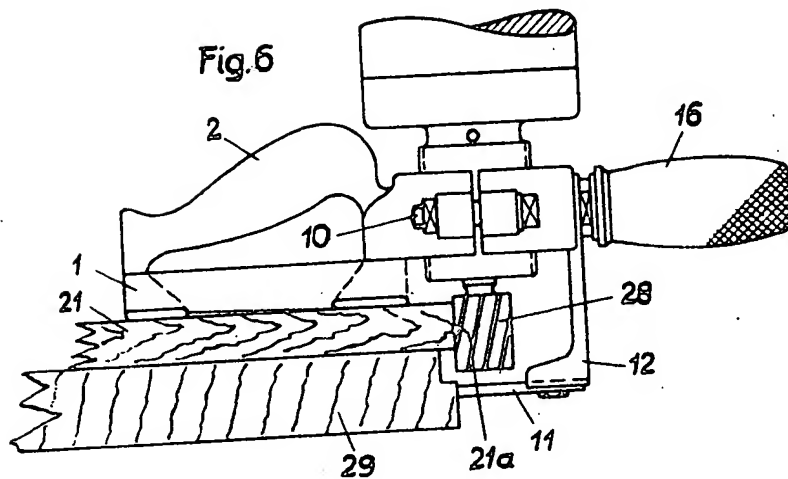
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SHEETS 1 & 2



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SHEET 3

